

TOWARD ECONOMIC INDEPENDENCE

By any measure, Native American communities today lack many of the resources and infrastructure capacity they need to promote viable economic development: gas, phones, roads, educational facilities, and electricity. As the examples here will demonstrate, photovoltaics is playing an ever-increasing role in a variety of economic enterprises.

Sandra Hamana operates Hamana So-o's Arts and Crafts at the village of Old Oraibi, Arizona, on the Hopi Reservation. The artist has adopted photovoltaics for her shop, the electricity from which allows fans, lights, music and the opportunity to do business as she wishes. No electrical lines are allowed at Old Oraibi, so the only other power choice for residents is diesel generators. *(Photos courtesy Sandra Hamana and Sandia National Laboratories)*



Local autonomy, with its emphasis on tribal values, is the foundation for economic independence.

▼ The Bad River Reservation in northwestern Wisconsin is the largest Chippewa reservation in the state. For more than a quarter-century, the tribe's fish hatchery has restocked millions of walleye into the Bad River System. The PV/hybrid wind system powers the activities of the hatchery and produces a significant portion of its electrical consumption during the year. *(Photo courtesy Great Northern Solar)*



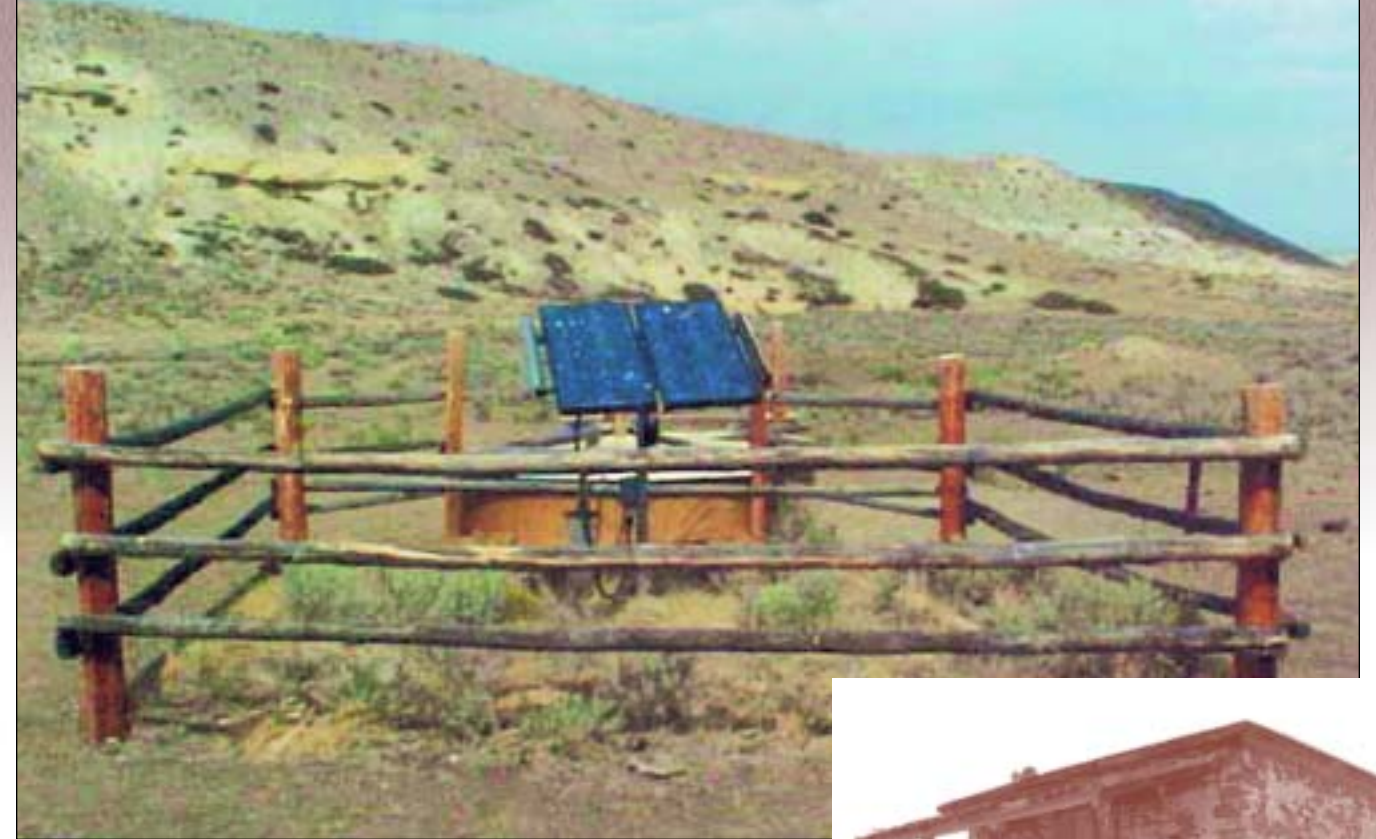
Traditional Navajo Market



The Hualapai Tribe of northern Arizona reaps the economic benefits of a growing tourist facility on the Grand Canyon Rim, which receives an average of 500 visitors daily. This commercial enterprise is operated as the Grand Canyon West Visitors Center. Since the facility lacked water resources, the tribe's creative decision was to pump from their Westwater location via photovoltaics from more than 26 miles away. For other necessary facilities at the site (located more than 20 miles from the electrical grid), solar power was a very attractive alternative. *(Photos courtesy The Solar Exchange and Sandia National Laboratories)*



▼ The Havasupai tribe of northern Arizona offers Grand Canyon tours (see page 24 to learn more about their PV installations). *(Photo courtesy Sandia National Laboratories)*



The Wind River Indian Reservation, located in west central Wyoming, is home to more than 3,000 Shoshone and more than 7,000 Arapaho tribal members. The Shoshone and Arapaho live on the same reservation, with trust affairs handled by the Bureau of Indian Affairs Wind River Agency, Ft. Washakie, Wyoming. For more than ten years, photovoltaic systems have pumped water at numerous wells throughout the 1.8 million acres of range and forest lands on the reservation. The rangelands are permitted to more than 100 individual ranchers, so PV helps provide one of the primary means of livelihood for the Shoshone and Arapaho. *(The Historic Wind River Agency Blockhouse, right) (Photos courtesy BIA Wind River Agency)*



▲ The Oneida Nation (Oneida, Wisconsin) has installed PV at several sites, including an elementary school, elder center, land management facility, and day care center, to create electricity for signage lighting. PV will soon play a large role in the tribe's economic development. The Oneida Community Grocery Store will feature a 10kW ground-mounted system, which will provide power to the Oneida Co-operative Grocery Store. The equipment and remodeling will also meet energy guidelines to lower the overall life-cycle maintenance budget and help on the profit margin. *(Photos courtesy Oneida Nation)*



The White Mountain Apache Tribe has been called the anchor of the economy of east central Arizona. They operate successful forest and resort enterprises equal to any, but they also operate one of the most unique economic activities to be found anywhere – their Trophy Elk Hunt, which would not be possible without power brought to them from the sun. Mountain-top PV installations on the expansive reservation help power the systems not only for routine communications during the hunt, but also for critical law enforcement surveillance and



The Ute Mountain Ute Tribe, located in Colorado (primarily) and New Mexico, rely on their Bow and Arrow cattle ranch, a vital economic enterprise for the tribe. Natural groundwater and runoff provide for most of their livestock water needs. But often-low annual rainfalls led them to seek other sources. Now photovoltaics powers water pumps at several locations. The hundreds of crossbred cattle roam at about 8,000 feet on a mesa overlooking the surrounding areas, including Towaoc, Colorado, headquarters for the Ute Mountain Utes. PV also provides lights at the bunkhouse. *(Logo courtesy Ute Mountain Ute Tribe Farm & Ranch Enterprise; photos courtesy Sandia National Laboratories)*



communications. Hunters from all over the world participate, and record-book elk have been taken here. With some permits sold for as much as \$30,000 each, it is easy to see how this business, facilitated by PV, brings more than one million dollars annually to the tribe. *(Photos courtesy Thelma Todachene and Joe Jojola)*

